

## NEW SECTION

**WAC 296-62-08003 Hexavalent chromium. Scope.** This standard applies to occupational exposures to chromium (VI) in all forms and compounds in general industry; construction; shipyards, marine terminals, and longshoring, except:

✎ Agricultural operations covered by chapter 296-307 WAC, Safety standards for agriculture.

✎ Exposures that occur in the application of pesticides regulated by the Washington state department of agriculture or another federal government agency (e.g., the treatment of wood with preservatives);

✎ Exposures to portland cement; or

✎ Where the employer has objective data demonstrating that a material containing chromium or a specific process, operation, or activity involving chromium cannot release dusts, fumes, or mists of chromium (VI) in concentrations at or above 0.5 (mu)g/m\3\ as an 8-hour time-weighted average (TWA) under any expected conditions of use.

## NEW SECTION

**WAC 296-62-08005 Definitions.** For the purposes of this section the following definitions apply:

**Action level** means a concentration of airborne chromium (VI) of 2.5 micrograms per cubic meter of air (2.5 (mu)g/m\3\) calculated as an 8-hour time-weighted average (TWA).

**Chromium (VI) (hexavalent chromium or Cr(VI))** means chromium with a valence of positive six, in any form and in any compound.

**Emergency** means any occurrence that results, or is likely to result, in an uncontrolled release of chromium (VI). If an incidental release of chromium (VI) can be controlled at the time of release by employees in the immediate release area, or by maintenance personnel, it is not an emergency.

**Employee exposure** means the exposure to airborne chromium (VI) that would occur if the employee were not using a respirator.

**High-efficiency particulate air (HEPA) filter** means a filter that is at least 99.97 percent efficient in removing mono-dispersed particles of 0.3 micrometers in diameter or

larger.

**Historical monitoring data** means data from chromium (VI) monitoring conducted prior to July 31, 2006, obtained during work operations conducted under workplace conditions closely resembling the processes, types of material, control methods, work practices, and environmental conditions in the employer's current operations.

**Objective data** means information such as air monitoring data from industry-wide surveys or calculations based on the composition or chemical and physical properties of a substance demonstrating the employee exposure to chromium (VI) associated with a particular product or material or a specific process, operation, or activity. The data must reflect workplace conditions closely resembling the processes, types of material, control methods, work practices, and environmental conditions in the employer's current operations.

**Physician or other licensed health care professional (PLHCP)** is an individual whose legally permitted scope of practice (i.e., license, registration, or certification) allows him or her to independently provide or be delegated the responsibility to provide some or all of the particular health care services required by WAC 296-62-08023.

**Regulated area** means an area, demarcated by the employer, where an employee's exposure to airborne concentrations of chromium (VI) exceeds, or can reasonably be expected to exceed, the PEL.

#### NEW SECTION

**WAC 296-62-08007 Permissible exposure limit (PEL).** Permissible exposure limit (PEL). The employer shall ensure that no employee is exposed to an airborne concentration of chromium (VI) in excess of 5 micrograms per cubic meter of air (5 (mu)g/m<sup>3</sup>), calculated as an 8-hour time-weighted average (TWA).

## NEW SECTION

**WAC 296-62-08009 Exposure determination.** (1) General. Each employer who has a workplace or work operation covered by this section shall determine the 8-hour TWA exposure for each employee exposed to chromium (VI). This determination shall be made in accordance with either subsection (2) or (3) of this section.

(2) Scheduled monitoring option.

(a) The employer shall perform initial monitoring to determine the 8-hour TWA exposure for each employee on the basis of a sufficient number of personal breathing zone air samples to accurately characterize full shift exposure on each shift, for each job classification, in each work area. Where an employer does representative sampling instead of sampling all employees in order to meet this requirement, the employer shall sample the employee(s) expected to have the highest chromium (VI) exposures.

(b) If initial monitoring indicates that employee exposures are below the action level, the employer may discontinue monitoring for those employees whose exposures are represented by such monitoring.

(c) If monitoring reveals employee exposures to be at or above the action level, the employer shall perform periodic monitoring at least every six months.

(d) If monitoring reveals employee exposures to be above the PEL, the employer shall perform periodic monitoring at least every three months.

(e) If periodic monitoring indicates that employee exposures are below the action level, and the result is confirmed by the result of another monitoring taken at least seven days later, the employer may discontinue the monitoring for those employees whose exposures are represented by such monitoring.

(f) The employer shall perform additional monitoring when there has been any change in the production process, raw materials, equipment, personnel, work practices, or control methods that may result in new or additional exposures to chromium (VI), or when the employer has any reason to believe that new or additional exposures have occurred.

(3) Performance-oriented option. The employer shall determine the 8-hour TWA exposure for each employee on the basis of any combination of air monitoring data, historical monitoring data, or objective data sufficient to accurately characterize

employee exposure to chromium (VI).

(4) Employee notification of determination results.

(a) In general industry where the exposure determination indicates that employee exposure exceeds the PEL, within fifteen working days the employer shall either post the results in an appropriate location that is accessible to all affected employees or shall notify each affected employee individually in writing of the results.

(b) In construction and shipyards, marine terminals, and longshoring where the exposure determination indicates that employee exposure exceeds the PEL, as soon as possible but not more than five working days later the employer shall either post the results in an appropriate location that is accessible to all affected employees or shall notify each affected employee individually in writing of the results.

(c) Whenever the exposure determination indicates that employee exposure is above the PEL, the employer shall describe in the written notification the corrective action being taken to reduce employee exposure to or below the PEL.

(5) Accuracy of measurement. Where air monitoring is performed to comply with the requirements of this section, the employer shall use a method of monitoring and analysis that can measure chromium (VI) to within an accuracy of plus or minus twenty-five percent and can produce accurate measurements to within a statistical confidence level of ninety-five percent for airborne concentrations at or above the action level.

(6) Observation of monitoring.

(a) Where air monitoring is performed to comply with the requirements of this section, the employer shall provide affected employees or their designated representatives an opportunity to observe any monitoring of employee exposure to chromium (VI).

(b) When observation of monitoring requires entry into an area where the use of protective clothing or equipment is required, the employer shall provide the observer with clothing and equipment and shall assure that the observer uses such clothing and equipment and complies with all other applicable safety and health procedures.

## NEW SECTION

### **WAC 296-62-08011 Regulated areas.**

**Exemption:** This section does not apply to construction, shipyards, marine terminals or longshoring.

(1) Establishment. The employer shall establish a regulated area wherever an employee's exposure to airborne concentrations of chromium (VI) is, or can reasonably be

expected to be, in excess of the PEL.

(2) Demarcation. The employer shall ensure that regulated areas are demarcated from the rest of the workplace in a manner that adequately establishes and alerts employees of the boundaries of the regulated area.

(3) Access. The employer shall limit access to regulated areas to:

(a) Persons authorized by the employer and required by work duties to be present in the regulated area;

(b) Any person entering such an area as a designated representative of employees for the purpose of exercising the right to observe monitoring procedures under WAC 296-62-08009;

(c) Any person authorized by the Washington Industrial Safety and Health Act (WISHA) or regulations issued under it to be in a regulated area.

#### NEW SECTION

**WAC 296-62-08013 Methods of compliance.** (1) Engineering and work practice controls.

(a) Except as permitted in (c) of this subsection, the employer shall use engineering and work practice controls to reduce and maintain employee exposure to chromium (VI) to or below the PEL unless the employer can demonstrate that such controls are not feasible. Wherever feasible engineering and work practice controls are not sufficient to reduce employee exposure to or below the PEL, the employer shall use them to reduce employee exposure to the lowest levels achievable, and shall supplement them by the use of respiratory protection that complies with the requirements of WAC 296-62-08015.

**Exemption:** This (b) does not apply to construction, shipyards, marine terminals and longshoring.

(b) Where painting of aircraft or large aircraft parts is performed in the aerospace industry, the employer shall use engineering and work practice controls to reduce and maintain employee exposure to chromium (VI) to or below 25 (mu)g/m\3\ unless the employer can demonstrate that such controls are not feasible. The employer shall supplement such engineering and work practice controls with the use of respiratory protection that complies with the requirements of WAC 296-62-08015 to achieve the PEL.

(c) Where the employer can demonstrate that a process or task does not result in any employee exposure to chromium (VI) above the PEL for thirty or more days per year (twelve consecutive months), the requirement to implement engineering and work practice controls to achieve the PEL does not apply to

that process or task.

(2) Prohibition of rotation. The employer shall not rotate employees to different jobs to achieve compliance with the PEL.

#### NEW SECTION

**WAC 296-62-08015 Respiratory protection.** (1) General. The employer shall provide respiratory protection for employees during:

(a) Periods necessary to install or implement feasible engineering and work practice controls;

(b) Work operations, such as maintenance and repair activities, for which engineering and work practice controls are not feasible;

(c) Work operations for which an employer has implemented all feasible engineering and work practice controls and such controls are not sufficient to reduce exposures to or below the PEL;

(d) Work operations where employees are exposed above the PEL for fewer than thirty days per year, and the employer has elected not to implement engineering and work practice controls to achieve the PEL; or

(e) Emergencies.

(2) Respiratory protection program. Where respirator use is required by this section, the employer shall institute a respiratory protection program in accordance with chapter 296-842 WAC, Respirators.

#### NEW SECTION

**WAC 296-62-08017 Protective work clothing and equipment.**

(1) Provision and use. Where a hazard is present or is likely to be present from skin or eye contact with chromium (VI), the employer shall provide appropriate personal protective clothing and equipment at no cost to employees, and shall ensure that employees use such clothing and equipment.

(2) Removal and storage.

(a) The employer shall ensure that employees remove all protective clothing and equipment contaminated with chromium (VI) at the end of the work shift or at the completion of their tasks involving chromium (VI) exposure, whichever comes first.

(b) The employer shall ensure that no employee removes

chromium (VI) contaminated protective clothing or equipment from the workplace, except for those employees whose job it is to launder, clean, maintain, or dispose of such clothing or equipment.

(c) When contaminated protective clothing or equipment is removed for laundering, cleaning, maintenance, or disposal, the employer shall ensure that it is stored and transported in sealed, impermeable bags or other closed, impermeable containers.

(d) Bags or containers of contaminated protective clothing or equipment that are removed from change rooms for laundering, cleaning, maintenance, or disposal shall be labeled in accordance with the requirements of WAC 296-800-170, Employer chemical hazard communication.

(3) Cleaning and replacement.

(a) The employer shall clean, launder, repair and replace all protective clothing and equipment required by this section as needed to maintain its effectiveness.

(b) The employer shall prohibit the removal of chromium (VI) from protective clothing and equipment by blowing, shaking, or any other means that disperses chromium (VI) into the air or onto an employee's body.

(c) The employer shall inform any person who launders or cleans protective clothing or equipment contaminated with chromium (VI) of the potentially harmful effects of exposure to chromium (VI) and that the clothing and equipment should be laundered or cleaned in a manner that minimizes skin or eye contact with chromium (VI) and effectively prevents the release of airborne chromium (VI) in excess of the PEL.

NEW SECTION

**WAC 296-62-08019 Hygiene areas and practices.** (1)  
General.

(a) General industry, shipyards, marine terminals and longshoring. Where protective clothing and equipment is required, the employer shall provide change rooms in conformance with WAC 296-800-230, Sanitation and hygiene facilities and procedures. Where skin contact with chromium (VI) occurs, the employer shall provide washing facilities in conformance with WAC 296-800-230, Sanitation and hygiene facilities and procedures. Eating and drinking areas provided by the employer shall also be in conformance with WAC 296-800-230, Sanitation and hygiene facilities and procedures.

(b) Construction. Where protective clothing and equipment

is required, the employer shall provide change rooms in conformance with WAC 296-155-17321, Hygiene facilities and practices. Where skin contact with chromium (VI) occurs, the employer shall provide washing facilities in conformance with WAC 296-155-17321, Hygiene facilities and practices. Eating and drinking areas provided by the employer shall also be in conformance with WAC 296-155-17321, Hygiene facilities and practices.

(2) Change rooms. The employer shall assure that change rooms are equipped with separate storage facilities for protective clothing and equipment and for street clothes, and that these facilities prevent cross-contamination.

(3) Washing facilities.

(a) The employer shall provide readily accessible washing facilities capable of removing chromium (VI) from the skin, and shall ensure that affected employees use these facilities when necessary.

(b) The employer shall ensure that employees who have skin contact with chromium (VI) wash their hands and faces at the end of the work shift and prior to eating, drinking, smoking, chewing tobacco or gum, applying cosmetics, or using the toilet.

(4) Eating and drinking areas.

(a) Whenever the employer allows employees to consume food or beverages at a worksite where chromium (VI) is present, the employer shall ensure that eating and drinking areas and surfaces are maintained as free as practicable of chromium (VI).

(b) The employer shall ensure that employees do not enter eating and drinking areas with protective work clothing or equipment unless surface chromium (VI) has been removed from the clothing and equipment by methods that do not disperse chromium (VI) into the air or onto an employee's body.

(5) Prohibited activities. The employer shall ensure that employees do not eat, drink, smoke, chew tobacco or gum, or apply cosmetics in areas where skin or eye contact with chromium (VI) occurs; or carry the products associated with these activities, or store such products in these areas.

## NEW SECTION

### **WAC 296-62-08021 Housekeeping.**

**Exemption:** This section does not apply to construction, shipyards, marine terminals and longshoring.

(1) General. The employer shall ensure that:

(a) All surfaces are maintained as free as practicable of accumulations of chromium (VI).

(b) All spills and releases of chromium (VI) containing material are cleaned up promptly.

(2) Cleaning methods.

(a) The employer shall ensure that surfaces contaminated with chromium (VI) are cleaned by HEPA-filter vacuuming or other methods that minimize the likelihood of exposure to chromium (VI).

(b) Dry shoveling, dry sweeping, and dry brushing may be used only where HEPA-filtered vacuuming or other methods that minimize the likelihood of exposure to chromium (VI) have been tried and found not to be effective.

(c) The employer shall not allow compressed air to be used to remove chromium (VI) from any surface unless:

(i) The compressed air is used in conjunction with a ventilation system designed to capture the dust cloud created by the compressed air; or

(ii) No alternative method is feasible.

(d) The employer shall ensure that cleaning equipment is handled in a manner that minimizes the reentry of chromium (VI) into the workplace.

(3) Disposal. The employer shall ensure that:

(a) Waste, scrap, debris, and any other materials contaminated with chromium (VI) and consigned for disposal are collected and disposed of in sealed, impermeable bags or other closed, impermeable containers.

(b) Bags or containers of waste, scrap, debris, and any other materials contaminated with chromium (VI) that are consigned for disposal are labeled in accordance with the requirements of WAC 296-800-170, Employer chemical hazard communication.

NEW SECTION

**WAC 296-62-08023 Medical surveillance.** (1) General.

(a) The employer shall make medical surveillance available at no cost to the employee, and at a reasonable time and place, for all employees:

(i) Who are or may be occupationally exposed to chromium (VI) at or above the action level for thirty or more days a year;

(ii) Experiencing signs or symptoms of the adverse health effects associated with chromium (VI) exposure; or

(iii) Exposed in an emergency.

(b) The employer shall assure that all medical examinations and procedures required by this section are performed by or under the supervision of a PLHCP.

(2) Frequency. The employer shall provide a medical

examination:

(a) Within thirty days after initial assignment, unless the employee has received a chromium (VI) related medical examination that meets the requirements of this paragraph within the last twelve months;

(b) Annually;

(c) Within thirty days after a PLHCP's written medical opinion recommends an additional examination;

(d) Whenever an employee shows signs or symptoms of the adverse health effects associated with chromium (VI) exposure;

(e) Within thirty days after exposure during an emergency which results in an uncontrolled release of chromium (VI); or

(f) At the termination of employment, unless the last examination that satisfied the requirements of WAC 296-62-08023, Medical surveillance was less than six months prior to the date of termination.

(3) Contents of examination. A medical examination consists of:

(a) A medical and work history, with emphasis on: Past, present, and anticipated future exposure to chromium (VI); any history of respiratory system dysfunction; any history of asthma, dermatitis, skin ulceration, or nasal septum perforation; and smoking status and history;

(b) A physical examination of the skin and respiratory tract; and

(c) Any additional tests deemed appropriate by the examining PLHCP.

(4) Information provided to the PLHCP. The employer shall ensure that the examining PLHCP has a copy of this standard, and shall provide the following information:

(a) A description of the affected employee's former, current, and anticipated duties as they relate to the employee's occupational exposure to chromium (VI);

(b) The employee's former, current, and anticipated levels of occupational exposure to chromium (VI);

(c) A description of any personal protective equipment used or to be used by the employee, including when and for how long the employee has used that equipment; and

(d) Information from records of employment-related medical examinations previously provided to the affected employee, currently within the control of the employer.

(5) PLHCP's written medical opinion.

(a) The employer shall obtain a written medical opinion from the PLHCP, within thirty days for each medical examination performed on each employee, which contains:

(i) The PLHCP's opinion as to whether the employee has any detected medical condition(s) that would place the employee at increased risk of material impairment to health from further exposure to chromium (VI);

(ii) Any recommended limitations upon the employee's exposure to chromium (VI) or upon the use of personal protective equipment such as respirators;

(iii) A statement that the PLHCP has explained to the employee the results of the medical examination, including any medical conditions related to chromium (VI) exposure that require further evaluation or treatment, and any special provisions for use of protective clothing or equipment.

(b) The PLHCP shall not reveal to the employer specific findings or diagnoses unrelated to occupational exposure to chromium (VI).

(c) The employer shall provide a copy of the PLHCP's written medical opinion to the examined employee within two weeks after receiving it.

#### NEW SECTION

**WAC 296-62-08025 Communication of chromium (VI) hazards to employees.** (1) General. In addition to the requirements of WAC 296-800-170, Employer chemical hazard communication, employers shall comply with the following requirements.

(2) Employee information and training.

(a) The employer shall ensure that each employee can demonstrate knowledge of at least the following:

(i) The contents of this section; and

(ii) The purpose and a description of the medical surveillance program required by (a)(i) of this subsection.

(b) The employer shall make a copy of this section readily available without cost to all affected employees.

#### NEW SECTION

**WAC 296-62-08027 Recordkeeping.** (1) Air monitoring data.

(a) The employer shall maintain an accurate record of all air monitoring conducted to comply with the requirements of this section.

(b) This record shall include at least the following information:

(i) The date of measurement for each sample taken;

(ii) The operation involving exposure to chromium (VI) that is being monitored;

(iii) Sampling and analytical methods used and evidence of

their accuracy;

(iv) Number, duration, and the results of samples taken;

(v) Type of personal protective equipment, such as respirators worn; and

(vi) Name, Social Security number, and job classification of all employees represented by the monitoring, indicating which employees were actually monitored.

(c) The employer shall ensure that exposure records are maintained and made available in accordance with chapter 296-802 WAC, Employee medical and exposure records.

(2) Historical monitoring data.

(a) Where the employer has relied on historical monitoring data to determine exposure to chromium (VI), the employer shall establish and maintain an accurate record of the historical monitoring data relied upon.

(b) The record shall include information that reflects the following conditions:

(i) The data were collected using methods that meet the accuracy requirements of WAC 296-62-08009(5);

(ii) The processes and work practices that were in use when the historical monitoring data were obtained are essentially the same as those to be used during the job for which exposure is being determined;

(iii) The characteristics of the chromium (VI) containing material being handled when the historical monitoring data were obtained are the same as those on the job for which exposure is being determined;

(iv) Environmental conditions prevailing when the historical monitoring data were obtained are the same as those on the job for which exposure is being determined; and

(v) Other data relevant to the operations, materials, processing, or employee exposures covered by the exception.

(c) The employer shall ensure that historical exposure records are maintained and made available in accordance with chapter 296-802 WAC, Employee medical and exposure records.

(3) Objective data.

(a) The employer shall maintain an accurate record of all objective data relied upon to comply with the requirements of this section.

(b) This record shall include at least the following information:

(i) The chromium (VI) containing material in question;

(ii) The source of the objective data;

(iii) The testing protocol and results of testing, or analysis of the material for the release of chromium (VI);

(iv) A description of the process, operation, or activity and how the data support the determination; and

(v) Other data relevant to the process, operation, activity, material, or employee exposures.

(c) The employer shall ensure that objective data are maintained and made available in accordance with chapter 296-802 WAC, Employee medical and exposure records.

(4) Medical surveillance.

(a) The employer shall establish and maintain an accurate record for each employee covered by medical surveillance under WAC 296-62-08023, Medical surveillance.

(b) The record shall include the following information about the employee:

(i) Name and Social Security number;

(ii) A copy of the PLHCP's written opinions;

(iii) A copy of the information provided to the PLHCP as required by WAC 296-62-08023(4).

(c) The employer shall ensure that medical records are maintained and made available in accordance with chapter 296-802 WAC, Employee medical and exposure records.

#### NEW SECTION

**WAC 296-62-08029 Dates.** (1) For employers with twenty or more employees, all obligations of this section, except engineering controls required by WAC 296-62-08013, commence November 27, 2006.

(2) For employers with nineteen or fewer employees, all obligations of this section, except engineering controls required by WAC 296-62-08013, commence May 30, 2007.

(3) For all employers, engineering controls required by WAC 296-62-08013 shall be implemented no later than May 31, 2010.

AMENDATORY SECTION (Amending Order 73-5, filed 5/9/73)

**WAC 296-24-680 Welding, cutting, and brazing.** You are required to protect employees from exposure to hexavalent chromium during the stainless steel welding process. See WAC 296-62-08003, Hexavalent chromium for specific criteria.

AMENDATORY SECTION (Amending Order 94-07, filed 7/20/94, effective 9/20/94)

**WAC 296-155-400 Gas welding and cutting. (1)**

Transporting, moving, and storing compressed gas cylinders.

(a) Valve protection caps shall be in place and secured.

(b) When cylinders are hoisted, they shall be secured on a cradle, slingboard, or pallet. They shall not be hoisted or transported by means of magnets or choker slings.

(c) Cylinders shall be moved by tilting and rolling them on their bottom edges. They shall not be intentionally dropped, struck, or permitted to strike each other violently.

(d) When cylinders are transported by powered vehicles, they shall be secured in a vertical position.

(e) Valve protection caps shall not be used for lifting cylinders from one vertical position to another. Bars shall not be used under valves or valve protection caps to pry cylinders loose when frozen. Warm, not boiling, water shall be used to thaw cylinders loose.

(f) Unless cylinders are firmly secured on a special carrier intended for this purpose, regulators shall be removed and valve protection caps put in place before cylinders are moved.

(g) A suitable cylinder truck, chain, or other steadying device shall be used to keep cylinders from being knocked over while in use. Such cylinders are not considered to be "in storage."

(h) When a job is finished, when cylinders are empty or when cylinders are moved at any time, the cylinder valve shall be closed.

(i) Compressed gas cylinders shall be secured in an upright position at all times except, if necessary, for short periods of time while cylinders are actually being hoisted or carried.

(j) Oxygen. Oxygen cylinders in storage shall be separated from fuel-gas cylinders or combustible materials (especially oil or grease), a minimum distance of 20 feet or by a noncombustible barrier at least 5 feet high having a fire-resistance rating of at least one-half hour.

**(2) Placing cylinders.**

(a) Cylinders shall be kept far enough away from the actual welding or cutting operation so that sparks, hot slag, or flame will not reach them. When this is impractical, fire resistant shields shall be provided.

(b) Cylinders shall be placed where they cannot become part

of an electrical circuit. Electrodes shall not be struck against a cylinder to strike an arc.

(c) Fuel gas cylinders shall be placed with valve end up whenever they are in use. They shall not be placed in a location where they would be subject to open flame, hot metal, or other sources of artificial heat.

(d) Cylinders containing oxygen or acetylene or other fuel gas shall not be taken into confined spaces.

(3) Treatment of cylinders.

(a) Cylinders, whether full or empty, shall not be used as rollers or supports.

(b) No person other than the gas supplier shall attempt to mix gases in a cylinder. No one except the owner of the cylinder or person authorized by the owner, shall refill a cylinder. No one shall use a cylinder's contents for purposes other than those intended by the supplier. All cylinders used shall meet the department of transportation requirements, Specification for Cylinders, (49 CFR Part 178, Subpart C).

(c) No damaged or defective cylinder shall be used.

(4) Use of fuel gas. The employer shall thoroughly instruct employees in the safe use of fuel gas, as follows:

(a) Before a regulator to a cylinder valve is connected, the valve shall be opened slightly and closed immediately. (This action is generally termed "cracking" and is intended to clear the valve of dust or dirt that might otherwise enter the regulator.) The person cracking the valve shall stand to one side of the outlet, not in front of it. The valve of a fuel gas cylinder shall not be cracked where the gas would reach welding work, sparks, flame, or other possible sources of ignition.

(b) The cylinder valve shall always be opened slowly to prevent damage to the regulator. For quick closing, valves on fuel gas cylinders shall not be opened more than 1 1/2 turns. When a special wrench is required, it shall be left in position on the stem of the valve while the cylinder is in use so that the fuel gas flow can be shut off quickly in case of an emergency. In the case of manifolded or coupled cylinders, at least one such wrench shall always be available for immediate use. Nothing shall be placed on top of a fuel gas cylinder, when in use, which may damage the safety device or interfere with the quick closing of the valve.

(c) Fuel gas shall not be used from cylinders through torches or other devices which are equipped with shutoff valves without reducing the pressure through a suitable regulator attached to the cylinder valve or manifold.

(d) Before a regulator is removed from a cylinder valve, the cylinder valve shall always be closed and the gas released from the regulator.

(e) If, when the valve on a fuel gas cylinder is opened, there is found to be a leak around the valve stem, the valve

shall be closed and the gland nut tightened. If this action does not stop the leak, the use of the cylinder shall be discontinued, and it shall be properly tagged and removed from the work area. In the event that fuel gas should leak from the cylinder valve, rather than from the valve stem, and the gas cannot be shut off, the cylinder shall be properly tagged and removed from the work area. If a regulator attached to a cylinder valve will effectively stop a leak through the valve seat, the cylinder need not be removed from the work area.

(f) If a leak should develop at a fuse plug or other safety device, the cylinder shall be removed from the work area.

(g) Cylinders not having fixed hand wheels shall have keys, handles, or nonadjustable wrenches on valve stems while in service. In multiple cylinder installations one and only one key or handle is required for each manifold.

(5) Fuel gas and oxygen manifolds.

(a) Fuel gas and oxygen manifolds shall bear the name of the substance they contain in letters at least 1-inch high which shall be either painted on the manifold or on a sign permanently attached to it.

(b) Fuel gas and oxygen manifolds shall be placed in safe, well ventilated, and accessible locations. They shall not be located within enclosed spaces.

(c) Manifold hose connections, including both ends of the supply hose that lead to the manifold, shall be such that the hose cannot be interchanged between fuel gas and oxygen manifolds and supply header connections. Adapters shall not be used to permit the interchange of hose. Hose connections shall be kept free of grease and oil.

(d) When not in use, manifold and header hose connections shall be capped.

(e) Nothing shall be placed on top of a manifold, when in use, which will damage the manifold or interfere with the quick closing of the valves.

(6) Hose.

(a) Fuel gas hose and oxygen hose shall be easily distinguishable from each other. The contrast may be made by different colors or by surface characteristics readily distinguishable by the sense of touch. Oxygen and fuel gas hoses shall not be interchangeable. A single hose having more than one gas passage shall not be used.

(b) When parallel sections of oxygen and fuel gas hose are taped together, not more than 4 inches out of 12 inches shall be covered by tape.

(c) All hose in use, carrying acetylene, oxygen, natural or manufactured fuel gas, or any gas or substance which may ignite or enter into combustion, or be in any way harmful to employees, shall be inspected at the beginning of each working shift. Defective hose shall be removed from service.

(d) Hose which has been subject to flashback, or which shows evidence of severe wear or damage, shall be tested to twice the normal pressure to which it is subject, but in no case less than 300 p.s.i. Defective hose, or hose in doubtful condition, shall not be used.

(e) Hose couplings shall be of the type that cannot be unlocked or disconnected by means of a straight pull without rotary motion.

(f) Boxes used for the storage of gas hose shall be ventilated.

(g) Hoses, cables, and other equipment shall be kept clear of passageways, ladders and stairs.

(7) Torches.

(a) Clogged torch tip openings shall be cleaned with suitable cleaning wires, drills, or other devices designed for such purpose.

(b) Torches in use shall be inspected at the beginning of each working shift for leaking shutoff valves, hose couplings, and tip connections. Defective torches shall not be used.

(c) Torches shall be lighted by friction lighters or other approved devices, and not by matches or from hot work.

(8) Regulators and gauges. Oxygen and fuel gas pressure regulators, including their related gauges, shall be in proper working order while in use.

(9) Oil and grease hazards. Oxygen cylinders and fittings shall be kept away from oil or grease. Cylinders, cylinder caps and valves, couplings, regulators, hose, and apparatus shall be kept free from oil or greasy substances and shall not be handled with oily hands or gloves. Oxygen shall not be directed at oily surfaces, greasy clothes, or within a fuel oil or other storage tank or vessel.

(10) Additional rules. For additional details not covered in this Part, applicable portions of American National Standards Institute, Z49.1-1973, Safety in Welding and Cutting, shall apply.

You are also required to protect employees from exposure to hexavalent chromium during the stainless steel welding process. See WAC 296-62-08003, Hexavalent chromium for specific criteria.

AMENDATORY SECTION (Amending Order 74-25, filed 5/7/74)

**WAC 296-304-040 Welding, cutting and heating--Scope and application.** All sections of this chapter which include WAC 296-304-040 in the section number apply to welding, cutting and heating.

You are also required to protect employees from exposure to hexavalent chromium during the stainless steel welding process. See WAC 296-62-08003, Hexavalent chromium for specific criteria.